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JC03 Rec'd PCT/PTO 26 OCT 2001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Werner WAGNER, Thomas ALLGEUER

Filed: Concurrently Herewith

For: HYGIENE PRODUCT COMPRISING A FILM WITH A NAP ARRANGEMENT

Serial No.: Unknown

International Application No.: PCT/EP00/03868

International Filing Date: April 28, 2000

Priority Date Claimed: April 28, 1999

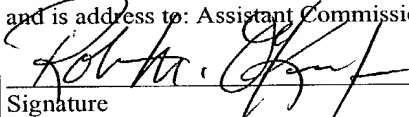
Group Art Unit: Unknown

Examiner: Unknown

Atty Dkt: ADVA:002

NUMBER: EV 044385769 US

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Signature

10-26-01
Date

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).

- b. ☒ has been transmitted by the International Bureau.
c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 317(c)(2)).
7. ☒ Amendments to claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
b. ☒ have been transmitted by the International Bureau. A translation of the Annex is included in this submission
c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) 35 U.S.C. 371(c)(4)).
10. ☐ a translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 317(c)(5)).
- Items 11 to 16 below concern document(s) or information included:
11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: Translation of Annex from the IPER; Abstract
17. ☐ The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492(a)(1) – (5)):

Neither international preliminary examination fee (37 CFR 1.482)
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO
and International Search Report not prepared by the EPO or JPO..... \$ 1040.00

International preliminary examination fee (37 CFR 1.482) not paid to
USPTO but International Search Report prepared by the EPO or JPO..... \$ 890.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO
but International search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$ 790.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO
but all claims did not satisfy provisions of PCT Article 33(10)-(4))..... \$ 710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO
and all claims satisfied provisions of PCT Article 33(1)-(4))..... \$ 100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

\$

FEE CALCULATION:

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	Total Claims (37 CFR 1.16(e))	<u>33</u> - 20 =	13	x \$ 18.00	\$ 234
	Independent Claims (37 CFR 1.16(b))	<u>3</u> - 3 =	0	x \$ 84.00	\$ 0
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			x \$ 280.00	\$ 0
				Basic Fee (from above)	\$ 890.00
				Total of above Calculations =	\$ 1124
	Reduction by 50% for filing by Small Entity (Note: 37 CFR 1.9, 1.27, 1.28)				\$ 0
	Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 29 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$ 0
	Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$ 0
	TOTAL NATIONAL FEE =				\$
	Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) \$40.00 per property.				\$
	TOTAL FEES ENCLOSED =				\$ 1124

- a. ☒ A check in the amount of \$1124.00 to cover the above fees is enclosed.
- b. ☒ If the check is inadvertently omitted, or should any additional fees under 37 CFR §1.16 to 1.21 be required for any reason relating to the enclosed materials, or should an overpayment be included herein, the Commissioner is authorized to deduct or credit said fees from or to Deposit Account No. 10-1205.

18. Please forward all correspondence to:

Robert M. O'Keefe
O'KEEFE, EGAN & PETERMAN
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, TX 78746

19. ☒ In accordance with 37 CFR 1.136(a)(3), the Commissioner is authorized to treat any concurrent or future reply that requires a petition for an extension of time under 37 CFR 1.126(a) to be timely, as incorporating a petition for extension of time for the appropriate length of time, and the Commissioner is authorized to deduct any requisite fees under 37 CFR 1.16 to 1.21 from Deposit Account No. 10-1205.

Respectfully submitted,

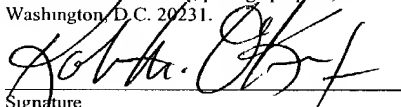
Robert M. O'Keefe
Reg. No. 35,630
Attorney for Applicants

O'KEEFE, EGAN & PETERMAN
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, TX 78746
(512) 347-1611
(512) 347-1615 (FAX)

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Werner WAGNER and Thomas ALLGEUER
Filed: Concurrently Herewith
For: HYGIENE PRODUCT COMPRISING A FILM WITH A NAP
ARRANGEMENT
Serial No.: Unknown
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International Filing Date: April 28, 2000
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Group Art Unit: Unknown
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NUMBER: EV 044385769 US	
I hereby certify that this paper or fee is being deposited with the United States Postal Service "EXPRESS MAIL POST OFFICE TO ADDRESSEE" service, postage prepaid, under 37 CFR 1.10 on the date indicated above and is address to: Assistant Commissioner of Patents, Washington, D.C. 20231.	
 Signature	<u>10-26-01</u> Date

Assistant Commissioner For Patents
Washington, D.C. 20231

Dear Sir:

PRELIMINARY AMENDMENT TO REDUCE FILING FEES

Please amend the application as follows.

The rewritten clean versions of all the specification and claim changes are provided below. Attached at the end of this paper is an Appendix providing an indication of the changes relative to the prior version of the specification, as now required by Rule 121.

In the specification:

On page 1, just below the title, please insert a new paragraph,

--This application claims priority to PCT application PCT/EP00/03868, filed April 28, 2000 in the European Patent Office, and to German application serial number 199 19 397.5, filed April 28, 1999, incorporated herein by reference.--

In the claims:

1. A hygiene product, with an upper side (30) that is permeable to fluids and intended for being in permanent contact with the skin, and with a lower side (20) that is preferably impermeable to fluids, wherein an absorbent layer is arranged between the upper side (30) and the lower side (20), wherein

the upper side (30) comprises a perforated film (200) that is composed of several layers and the top layer of which is entirely or partially covered with a fibrous web, and wherein the film is provided with a nap arrangement that is worked from the top film layer characterized by the fact that naps (2) are worked, in an integrated fashion, from at least the film material situated on the surface merely by pressing said film material into cavities (250) of a female mold, subjecting the film material to pressure and cooling the film material solely by means of a calender (220), and by the fact that the film material that remains adhering to the interior of the cavities (250) is subsequently withdrawn.

2. The hygiene product according to Claim 1, characterized by the fact that the lower side (20) comprises a multi-layer film that is permeable to vapors and impermeable to fluids, wherein the multi-layer film is covered with a fibrous web.

3. The hygiene product according to Claim 1, characterized by the fact that the lower side (20) comprises a non-perforated film that is composed of several layers, wherein the top layer of said film is entirely or partially covered with a fibrous web.

4. The hygiene product according to Claim 1, characterized by the fact that the hygiene product has a first side and a second side which respectively comprise the film (200) with a nap arrangement.
5. The hygiene product according to Claim 1, characterized by the fact that the nap arrangement of the first side has a different length than the nap arrangement of the second side.
6. The hygiene product according to Claim 1, characterized by the fact that the upper side (30) and/or the lower side (20) comprise at least one strip with the film that is provided with a fibrous web.
7. The hygiene product according to Claim 1, characterized by the fact that the naps (2) which form the fibrous web of the lower side (20) have a length between 100 micrometer and 400 micrometer, and by the fact that the naps (2) which form the fibrous web of the upper side (30) have a length between 50 micrometer and 150 micrometer.
8. The hygiene product according to Claim 1, characterized by the fact that an additional substance is applied onto the fibrous web.
9. The hygiene product according to Claim 1, characterized by the fact that at least one skin care substance is applied onto the fibrous web of the upper side (30).
10. The hygiene product according to Claim 1, characterized by the fact that the tip of a nap (2) approximately has a crater-like shape that is the least partially hollow in its interior.
11. The hygiene product according to Claim 1, characterized by the fact that the fibrous web of the lower side (20) makes it possible to fix the hygiene product on a contact surface.
12. The hygiene product according to Claim 1, characterized by the fact that the top layer of the upper side (30) is only partially covered with the fibrous web, and by the fact that a connecting means is applied onto the surface section of the

upper side (30) which is not provided with a fibrous web, wherein the connecting means is an adhesive.

13. The hygiene product according to Claim 1, characterized by the fact that the hygiene product comprises an incontinence article.

14. The hygiene product according to Claim 1, characterized by the fact that the hygiene product comprises a bed insert.

15. The hygiene product according to Claim 1, characterized by the fact that the hygiene product comprises a bandaging material.

16. The hygiene product according to Claim 15, characterized by the fact that the naps (2) of the fibrous web of the wound bandaging or wound covering material have a different length in the wound contact region than outside of the wound contact region.

17. The hygiene product according to Claim 16, characterized by the fact that the fibrous web has a length between 50 and 150 micrometer in the wound contact region and a length between 0 and 80 micrometer outside of this wound contact region.

18. The hygiene product according to Claim 1, characterized by the fact that the upper side (30) and the lower side (20) are essentially manufactured from the same material, namely from a single-layer or multi-layer film that comprises a thermoplastic plastic and is provided with a fibrous web on at least one side, wherein the fibrous web is, in an integrated fashion, worked from the film material situated on the surface, wherein the film used for the upper side (20) is provided with perforations (1) that lie underneath the fibrous web, and wherein the film used for the lower side (30) does not contain such perforations (1).

19. The hygiene product according to claim 1, characterized by the fact that the naps (2) have a diameter of approximately 5 μm - 80 μm .

20. The hygiene product according to Claim 1, characterized by the fact that the naps (2) have a length between 80 and 800 μm .

21. The hygiene product according to Claim 1, characterized by the fact that the film (200) is printed.

22. A method for manufacturing a hygiene product, wherein a film (200) is used which contains a thermoplastic polymer and is additionally processed into a hygiene product, and wherein

a fibrous web consisting of a nap arrangement is produced on a least one side of the film, characterized by the fact that

naps (2) are worked, in an integrated fashion, from at least the film material situated on the surface merely by pressing said film material into cavities (250) of a female mold, subjecting the film material to pressure and cooling the film material solely by means of a calender (220), and by the fact that the film material that remains adhering to the interior of the cavities (250) is subsequently withdrawn, wherein the upper side (30) is intended for being in permanent contact with the skin.

23. The method according to Claim 22, characterized by the fact that the film (200) is withdrawn in such a way that the naps (2) are stretched by no more than a third of their length.

24. The method according to Claim 22, characterized by the fact that a withdrawn nap (2) assumes an approximately crater-like shape at its tip.

25. The method according to Claim 22, for perforating the film (200) that is provided with a nap arrangement, characterized by the fact that a female mold/male mold perforation by means of a porcupine roller (325) and a female mold roller (330) provided with holes is carried out at a temperature that lies below the temperature at which the naps (2) are destroyed.

26. The method according to Claim 22, characterized by the fact that an extractable substance is arranged in the film (200) in such a way that, when the substance is extracted from the film (200), openings are created in the film regions between adjacent naps (2).

27. The method according to claim 22, characterized by the fact that the film (200) is additionally processed into an upper side (30) and a lower side (20) of the hygiene product.

28. The method according to Claim 22, characterized by the fact that a hygiene product is manufactured which comprises an upper side (30) that is permeable to fluids and a lower side (20) that is permeable to fluids, wherein an absorbent layer is arranged between the upper side and the lower side, wherein a multi-layer perforated film (200), the top layer of which is entirely or partially covered with a fibrous web, is used for the upper side (30), and wherein the upper side (30) is intended for being in permanent contact with the skin.

29. The method according to Claim 22, characterized by the fact that the film (200) with its nap arrangement is arranged in such a way that the naps (2) point into the interior of the hygiene product.

30. A device for manufacturing a hygiene product, comprising a device (205) for producing a napped film (200) that is provided with a fibrous web comprising a nap arrangement on a least one side, and with a device (215) for supplying the film (200), characterized by the fact that

- one roller (230) of a calender (220) contains cavities (250), by the fact that
- the pressure in the calender gap (270) and the rotational speed of one calender roller can be adjusted such that a thermoplastic material guided through the calender gap (270) is pressed into cavities (250), and by the fact that
- the film (200) is guided into the calender gap (270) by the supply device (215) in order to press the film into the cavities (250), wherein
- the cavities (250) have a diameter of up to 0.15 millimeter, and wherein the roller (230) is heated to a maximum temperature that lies slightly below the melting temperature of the film (200).

31. The device (205) according to Claim 30, characterized by the fact that a withdrawal device makes it possible to vary the angle of withdrawal.

32. The device (205) according to Claim 30, characterized by the fact that an additional processing station (310) is arranged downstream of the device.

33. The device (205) according to Claim 30, characterized by the fact that an in-line perforating station is arranged downstream or upstream of the device.

The claim amendments are submitted to correct minor matters as to form and to remove all of the multiple dependent claims to thereby reduce the filing fee. These claim amendments are not submitted for purposes of overcoming prior art.

REMARKS

Should any fees under 37 CFR 1.16-1.21 be required for any reason relating to the enclosed materials, the Commissioner is authorized to deduct such fees from Deposit Account No. 10-1205/ADVA:002. The examiner is invited to contact the undersigned at the phone number indicated below with any questions or comments, or to otherwise facilitate expeditious and compact prosecution of the application.

Respectfully submitted,

Robert M. O'Keefe
Registration No. 35,630
Attorney for Applicant

O'KEEFE, EGAN & PETERMAN
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, Texas 78746
(512) 347-1611
FAX: (512) 347-1615

APPENDIX
MARKED UP VERSION OF AMENDMENTS
AS REQUIRED BY RULE 121

In The Claims:

1. A hygiene product, with an upper side (30) that is permeable to fluids and intended for being in permanent contact with the skin, and with a lower side (20) that is preferably impermeable to fluids, wherein an absorbent layer is arranged between the upper side (30) and the lower side (20), wherein

the upper side (30) comprises a perforated film (200) that is composed of several layers and the top layer of which is entirely or partially covered with a fibrous web, and wherein the film is provided with a nap arrangement that is worked from the top film layer characterized by the fact that naps (2) are worked, in an integrated fashion, from at least the film material situated on the surface merely by pressing said film material into cavities (250) of a female mold, subjecting the film material to pressure and cooling the film material solely by means of a calender (220), and by the fact that the film material that remains adhering to the interior of the cavities (250) is subsequently withdrawn.

2. The hygiene product according to Claim 1, characterized by the fact that the lower side (20) comprises a multi-layer film that is permeable to vapors and impermeable to fluids, wherein the multi-layer film is covered with a fibrous web.

3. (Amended) The hygiene product according to Claim 1 [or 2], characterized by the fact that the lower side (20) comprises a non-perforated film that is composed of several layers, wherein the top layer of said film is entirely or partially covered with a fibrous web.

4. (Amended) The hygiene product according to [one of Claims 1 - 3] Claim 1, characterized by the fact that the hygiene product has a first side and a second side which respectively comprise the film (200) with a nap arrangement.

5. (Amended) The hygiene product according to [one of Claims 1 - 4] Claim 1, characterized by the fact that the nap arrangement of the first side has a different length than the nap arrangement of the second side.
6. (Amended) The hygiene product according to [one of Claims 1 - 5] Claim 1, characterized by the fact that the upper side (30) and/or the lower side (20) comprise at least one strip with the film that is provided with a fibrous web.
7. (Amended) The hygiene product according to [one of Claims 1 - 6] Claim 1, characterized by the fact that the naps (2) which form the fibrous web of the lower side (20) have a length between 100 micrometer and 400 micrometer, and by the fact that the naps (2) which form the fibrous web of the upper side (30) have a length between 50 micrometer and 150 micrometer.
8. (Amended) The hygiene product according to [one of the preceding claims] Claim 1, characterized by the fact that an additional substance is applied onto the fibrous web.
9. (Amended) The hygiene product according to [one of the preceding claims] Claim 1, characterized by the fact that at least one skin care substance is applied onto the fibrous web of the upper side (30).
10. (Amended) The hygiene product according to [one of the preceding claims] Claim 1, characterized by the fact that the tip of a nap (2) approximately has a crater-like shape that is the least partially hollow in its interior.
11. (Amended) The hygiene product according to [one of the preceding claims] Claim 1, characterized by the fact that the fibrous web of the lower side (20) makes it possible to fix the hygiene product on a contact surface.
12. (Amended) The hygiene product according to [one of the preceding claims] Claim 1, characterized by the fact that the top layer of the upper side (30) is only partially covered with the fibrous web, and by the fact that a connecting means[, in particular, an adhesive,] is applied onto the surface section of the upper side (30) which is not provided with a fibrous web, wherein the connecting means is an adhesive.

13. (Amended) The hygiene product according to [one of the preceding claims] Claim 1, characterized by the fact that the hygiene product [consists of] comprises an incontinence article.

14. (Amended) The hygiene product according to [one of the preceding claims] Claim 1, characterized by the fact that the hygiene product [consists of] comprises a bed insert.

15. (Amended) The hygiene product according to [one of Claims 1 - 14] Claim 1, characterized by the fact that the hygiene product [consists of] comprises a bandaging material[, in particular, a wound bandaging or wound covering material].

16. The hygiene product according to Claim 15, characterized by the fact that the naps (2) of the fibrous web of the wound bandaging or wound covering material have a different length in the wound contact region than outside of the wound contact region.

17. The hygiene product according to Claim 16, characterized by the fact that the fibrous web has a length between 50 and 150 micrometer in the wound contact region and a length between 0 and 80 micrometer outside of this wound contact region.

18. (Amended) The hygiene product according to [one of the preceding claims] Claim 1, characterized by the fact that the upper side (30) and the lower side (20) are essentially manufactured from the same material, namely from a single-layer or multi-layer film that [consists of] comprises a thermoplastic plastic and is provided with a fibrous web on at least one side, wherein the fibrous web is, in an integrated fashion, worked from the film material situated on the surface, wherein the film used for the upper side (20) is provided with perforations (1) that lie underneath the fibrous web, and wherein the film used for the lower side (30) does not contain such perforations (1).

19. (Amended) The hygiene product according to [one of the preceding claims] claim 1, characterized by the fact that the naps (2) have a diameter of approximately 5 μm - 80 μm [, in particular, an average diameter between 40 μm and 70 μm].

20. (Amended) The hygiene product according to [one of the preceding claims] Claim 1, characterized by the fact that the naps (2) have a length between 80 and 800 μm], wherein the length of the naps preferably lies between 110 μm and 400 μm , in particular, between 130 mm and 190 μm].

21. (Amended) The hygiene product according to [one of the preceding claims] Claim 1, characterized by the fact that the film (200) is printed.

22. A method for manufacturing a hygiene product, wherein a film (200) is used which contains a thermoplastic polymer and is additionally processed into a hygiene product, and wherein

a fibrous web consisting of a nap arrangement is produced on a least one side of the film, characterized by the fact that

naps (2) are worked, in an integrated fashion, from at least the film material situated on the surface merely by pressing said film material into cavities (250) of a female mold, subjecting the film material to pressure and cooling the film material solely by means of a calender (220), and by the fact that the film material that remains adhering to the interior of the cavities (250) is subsequently withdrawn, wherein the upper side (30) is intended for being in permanent contact with the skin.

23. (Amended) The method according to Claim 22, characterized by the fact that the film (200) is withdrawn in such a way that the naps (2) are stretched by no more than a third of their length[, in particular, such that a stretching of no more than 10 % takes place].

24. (Amended) The method according to Claim 22 [or 23], characterized by the fact that a withdrawn nap (2) assumes an approximately crater-like shape at its tip.

25. The method according to Claim 22[, 23 or 24] for perforating the film (200) that is provided with a nap arrangement, characterized by the fact that a female mold/male mold perforation by means of a porcupine roller (325) and a

female mold roller (330) provided with holes is carried out at a temperature that lies below the temperature at which the naps (2) are destroyed.

26. (Amended) The method according to [one of Claims 22 - 25] Claim 22, characterized by the fact that an extractable substance is arranged in the film (200) in such a way that, when the substance is extracted from the film (200), openings are created in the film regions between adjacent naps (2).

27. (Amended) The method according to [one of Claims 22 - 26] claim 22, characterized by the fact that the film (200) is additionally processed into an upper side (30) and a lower side (20) of the hygiene product.

28. (Amended) The method according to [one of Claims 22 - 27] Claim 22, characterized by the fact that a hygiene product is manufactured which comprises an upper side (30) that is permeable to fluids and a lower side (20) that is permeable to fluids, wherein an absorbent layer is arranged between the upper side and the lower side, wherein a multi-layer perforated film (200), the top layer of which is entirely or partially covered with a fibrous web, is used for the upper side (30), and wherein the upper side (30) is intended for being in permanent contact with the skin.

29. (Amended) The method according to [one of Claims 22 - 28] Claim 22, characterized by the fact that the film (200) with its nap arrangement is arranged in such a way that the naps (2) point into the interior of the hygiene product.

30. (Amended) A device for manufacturing a hygiene product, comprising a device (205) for producing a napped film[, i.e., a film] (200) that is provided with a fibrous web [consisting of] comprising a nap arrangement on a least one side, and with a device (215) for supplying the film (200), characterized by the fact that

- one roller (230) of a calender (220) contains cavities (250), by the fact that
- the pressure in the calender gap (270) and the rotational speed of one calender roller can be adjusted such that a thermoplastic material guided through the calender gap (270) is pressed into cavities (250), and by the fact that

- the film (200) is guided into the calender gap (270) by the supply device (215) in order to press the film into the cavities (250), wherein

- the cavities (250) have a diameter of up to 0.15 millimeter, and wherein the roller (230) is heated to a maximum temperature that lies slightly below the melting temperature of the film (200).

31. The device (205) according to Claim [31] 30, characterized by the fact that a withdrawal device makes it possible to vary the angle of withdrawal.

32. (Amended) The device (205) according to Claim [31 or 32] 30, characterized by the fact that an additional processing station (310)[, in particular, a printing station,] is arranged downstream of the device.

33. (Amended) The device (205) according to [one of Claims 31, 32 or 33] Claim 30, characterized by the fact that an in-line perforating station is arranged downstream or upstream of the device.

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- 1 -

HYGIENE PRODUCT COMPRISING A FILM WITH A NAP
ARRANGEMENT

5 The invention pertains to a method for manufacturing a hygiene product, a device for manufacturing a hygiene product and a correspondingly manufactured hygiene product, wherein a film that comprises a fibrous web is used.

10 A textile backsheet for the hygiene sector which comprises a fibrous web is, for example, known from subsequently published patent DE 198 43 109 A1.

Hygiene products known from the pertinent state of the art, for example, disposable diapers and female sanitary napkins, contain an upper side or topsheet and a lower side or backsheet, between which an absorbent layer is arranged. The so-called topsheet, i.e., the cover layer of the hygiene product which faces the body, is usually designed such that it is permeable to fluids. The so-called backsheet, i.e., the layer of the hygiene product which faces away from the body, is usually designed such that it is impermeable to fluids. The absorbent layer consists of an absorbent insert, for example, of cellular material, natural fibers, artificial fibers, wool or cotton. This material may additionally contain superabsorbers. A product of this type is, for example, known from DE 92 19 163.

Based on the aforementioned state of the art, the invention aims to develop a hygiene product that can be easily and inexpensively manufactured and in which the upper side or topsheet and, if applicable, the lower side or backsheet exhibit other advantageous properties in addition to their barrier properties, for example, a textile feel, an aesthetically appealing appearance and an improved compatibility with the human skin. In addition, the invention aims to disclose a rational method for manufacturing a hygiene product, as well as a corresponding device for manufacturing a hygiene product.

These objectives are respectively attained with a hygiene product that is realized in accordance with the characteristics of Claim 1, a method for manufacturing a hygiene product that is carried out in accordance with the characteristics of Claim 22, as well as a device for manufacturing a hygiene product that is realized in accordance with the characteristics of Claim 31. Advantageous additional developments are disclosed in the subclaims.

A hygiene product according to the invention comprises at least one structure consisting of a topsheet, a backsheet and an absorbent layer, with the topsheet containing a film of a thermoplastic plastic or preferably consisting of
5 such a film. The topsheet film contains a fibrous web on one side (surface), with the fibrous web being worked, in an integrated fashion, from the film material situated on the surface. The surface of the topsheet which is provided with the fibrous web is preferably situated on the side that faces away from the absorbent layer. When using the hygiene product, the surface of the topsheet which is
10 provided with the fibrous web is situated on the side that faces the body of the user. The topsheet also has continuous perforations that, when using the hygiene product, only allow the permeation of fluids, in particular, bodily fluids, in the direction of and preferably no farther than the absorbent layer. The topsheet film preferably comprises several layers, i.e., at least two layers. According to one
15 embodiment, the backsheet contains no perforations and is impermeable to fluids. A preferred hygiene product contains a topsheet that is realized in the previously described fashion and a backsheet that contains a single-layer or preferably multi-layer film of a thermoplastic plastic or preferably consists of such a film. In this preferred embodiment, the backsheet film has a fibrous web on at least one side or
20 surface, wherein the fibrous web is worked, in an integrated fashion, from the material of the film situated on the surface. This surface of the backsheet which is provided with the fibrous web is situated on the side that faces away from the absorbent layer. When using the hygiene product, the surface of the backsheet which has the fibrous web is situated on the side that faces away from the body of
25 the user or wearer.

The topsheet film and the backsheet film respectively may - independently of one another - contain one layer or preferably several layers. The design and composition of the topsheet and the backsheet may be identical and, for example,
30 merely differ due to the fact that the topsheet is perforated. In another embodiment of the present invention, the topsheet and the backsheet are designed differently, for example, with respect to the type and number of layers used, the composition and/or the design of the fibrous web. The backsheet may be actively breathing or permeable to water vapors.

35

The so-called fibrous web or hairy web which characterizes the surface of the topsheet and, if applicable, the surface of the backsheet is composed of a series

of fine hairs that are essentially directed upward and consist of the same thermoplastic plastic as the respective film layer situated on the surface, from which the hairs are worked. Film surfaces with 2000 -12,000 individual hairs per square centimeter proved particularly advantageous. The hairs preferably have a diameter between approximately 20 micrometer (μm) and 140 micrometer, with a diameter between approximately 20 and 80 micrometer being particularly preferred. The length of the hairs advantageously lies on the order of approximately 80 micrometer-800 micrometer. Depending on the type and function of the hygiene product, the fibrous web, in particular, the fibrous web of the topsheet, may contain additional substances, for example, (skin) care substances, disinfecting substances, odor-absorbing substances, odor-inhibiting and/or aroma-emitting substances. Suitable substances include cosmetics, aromatics and salves.

The nap web provides the topsheet with a velvet-like or velour-like surface which the user perceives as particularly comfortable when it comes in contact with the skin, in particular, in comparison to a smooth or merely embossed plastic film, because it has a feel similar to a textile. In the hygiene products according to the invention, the regions of the topsheet surface which, when using the hygiene products, come in contact with the body or the skin of the user (for example, with bed inserts) or the wearer (for example, with diapers or female hygiene articles) preferably are, in essence, covered with the nap web in their entirety.

Hygiene products of the described design usually represent disposable articles and are not intended for being reused. Such hygiene products have the function of absorbing and retaining bodily excretions, in particular, liquid bodily excretions such as urine, blood or sweat, and are in constant contact with the body of the user or wearer. Preferred hygiene products consist of female hygiene articles, in particular, female sanitary napkins and slip inserts, wound bandaging or wound covering materials, bed inserts and, in particular, incontinence articles such as baby diapers, diapers for adults or incontinence pads for adults.

In addition to the design comprising a perforated top sheet with a fibrous web surface which is permeable to fluids, an absorbent intermediate layer and a backsheet that is impermeable to fluids and preferably also has a fibrous web surface, the hygiene products may also contain other structures, elements or means, in particular, structures, elements or means that improve their function, for

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example, means for fixing the hygiene product or parts thereof, means for holding together the hygiene product or parts thereof, an elastic waistband or a lateral leakage protection or leg leakage protection. The fibrous web is preferably arranged at all locations at which a direct and constant contact with the body of the user takes place. However, it would also be conceivable to at least partially cover the fibrous web surface with a material. The material may, for example, stem from another product that is brought in contact with the hygiene product.

When using the hygiene product, the topsheet or cover sheet represents the surface of the hygiene product which faces the body, usually the skin, of the user - for example, with bed inserts - or the wearer--for example, with diapers, slip inserts or female sanitary napkins. This topsheet consists of a single-layer or multi-layer plastic film that is provided with the described fibrous web on the surface that faces the body of the user or wearer. The plastic film consists of a thermoplastic polymer or of several different thermoplastic polymers and advantageously contains no fleece material.

Suitable polymers are, for example, polyactate (PLA) polyamides, polyvinyl alcohols, polyester, polyether ester and polyester amides and, in particular, polyolefins, as well as mixtures thereof. Preferred polyolefins are propylene homopolymers and/or copolymers and, in particular, ethylene homopolymers and/or copolymers. Preferred ethylene copolymers are copolymers of ethylene containing one or more aliphatic alpha-olefin(s) with between three and twenty carbon atoms, in particular, butene, pentene, hexene or octene, ethylene-styrene-copolymers, copolymers of ethylene with one ionomer, ethylene copolymers with vinyl acetate or ethylene copolymers with acrylic acid (acrylate).

The polymers for the topsheet are advantageously chosen such that the topsheet is soft and expandable.

The multi-layer topsheets or topsheet films consist, in particular, of two, three, four or five plastic films, with the individual layers either having the same or a different composition.

The perforated plastic film that is provided with the nap web and used for the topsheet advantageously has a specific weight of approximately twenty to eighty grams per square meter.

The topsheet of the hygiene product is perforated. The term perforations refers, for example, to holes, slots or other regularly or irregularly arranged openings. Accordingly, the term perforating refers to the process of producing
5 these openings. The perforations of the topsheet are continuous, i.e., they extend through the entire thickness of the topsheet in the form of channels that are permeable to fluids. In a given topsheet, the size and/or the density of the perforations may be variable. For example, marginal regions of the topsheet may, if they only influence its function insignificantly, remain non-perforated or only
10 contain a few and/or smaller perforations. Regions that are subjected to higher stresses and particularly important for the function of the topsheet ("high impact zones") may contain larger perforations and/or have a higher perforation density.

The absorbent layer has the function of physically and/or chemically
15 binding bodily fluids. In the hygiene product according to the invention, this layer is arranged between the topsheet and the backsheet. Suitable materials for manufacturing this layer are known and include, for example, cellular materials, natural fibers, artificial fibers, wool, foamed materials or cotton. The layers may also contain suitable additives, for example, superabsorbers, in order to increase
20 the absorbency.

When using the hygiene product, the backsheet or the bottom layer of the hygiene product forms the side that faces away from the body of the user or wearer. However, this side may also come in contact with the human skin when
25 handling the hygiene product, e.g., with the skin of the person changing a baby diaper. This means that a velvet-like or velour-like surface, as well as a superior feel, would also be desirable on the backsheet. The backsheet of the hygiene product essentially is impermeable to water. In the preferred hygiene products, the backsheet comprises or consists of a single-layer or multi-layer plastic film. This
30 plastic film consists of one or more different thermoplastic polymers. Suitable polymers are, for example, polyactate (PLA), polyamides, polyvinyl alcohols, polyester, polyether ester and polyester amides and, in particular, polyolefins, as well as mixtures thereof. Other suitable polymers include preferred ethylene homopolymers and/or copolymers, for example, as mentioned above, as well as,
35 in particular, propylene homopolymers and/or copolymers.

The polymers for the backsheet are advantageously chosen such that the backsheet has a high resistance to tearing, a high impact penetration strength and, if so desired - for example, with baby diapers - a high resistance to abrasion. If the material is suitably chosen, the backsheet contributes to fixing the hygiene product on a given surface. For example, the backsheet of a female sanitary napkin has such a consistency that it stabilizes its position in a slip. The backsheet of a bed insert has such a consistency that it prevents or at least impairs the sliding movement of the bed insert in a bed.

Multi-layer backsheets consist, in particular, of two, three, four or five plastic films, with the individual plastic films either having the same or a different composition.

The plastic film that is provided with the nap web and used for the backsheet advantageously has a specific weight of approximately 20 - 100 grams per square meter.

In one preferred embodiment, the topsheet and the backsheet of the hygiene product are provided with a fibrous web. The naps that form the fibrous web of the backsheet may be longer than the naps that form the fibrous web of the topsheet.

The fibrous web covers at least partial regions of the respective film surface(s). If so desired, the respective film surfaces may, in essence, be entirely covered with the fibrous web.

The hygiene products which are intended for being used only once, i.e., so-called disposable hygiene products, can be manufactured and used in large quantities, with a particularly superior compatibility with the human skin being ensured in addition to the functional properties.

The invention also proposes to manufacture a film with a fibrous web consisting of a nap arrangement that is situated on at least one side of said film by working the naps, in an integrated fashion, from at least the film material situated on of the surface by pressing said film material into the openings of a female mold solely by means of a calendar and subsequently withdrawing the film material. In this case, the film of thermoplastic material is in contact with the female mold in a

be variably adjusted. The rotational speed of the calendar roller that is provided with the cavities may, in particular, be used as the parameter for adjusting the angle of withdrawal. An even higher accuracy can be achieved if the pressure in the calendar gap and material parameters that depend on, for example, the processing temperature are also taken into consideration. This makes it possible to manufacture the hygiene product under the control of a characteristic diagram, wherein a characteristic diagram produced for a certain material can be correspondingly adapted to different calendar systems. The film is preferably lifted off the female mold at an angle between 5° and 75°.

The functional properties of the film can be influenced by means of various processing stations. For example, a perforated film with a nap arrangement is obtained if the film passes through a subsequently arranged perforating station. The manufacturing process can be accelerated if the processing station is designed in-line with the calendar. In addition to the mechanical perforations, the extraction of an extractable substance that, for example, is realized by stretching the film may be considered. The corresponding station and a roller designed for stretching purposes may also be arranged in-line. It would also be conceivable to design the film provided with a nap arrangement in certain colors, e.g., by printing the film. It is preferred to print the surfaces that are provided with the naps, wherein the printed surface may also be subjected to subsequent treatments. For example, a color fastener may be applied after the printing process. This printing process is carried out by guiding the film into a corresponding device that preferably makes it possible to print the film over its entire width. Depending on the intended use, conventional ink as it is, for example, used in ink jet printers may be used for printing the film. An ink jet printing process also makes it possible to print the film with a color design.

If at least one of the two sides of the hygiene product comprises the film with a nap arrangement, the softness of the hygiene product is significantly improved for the user in this region, with a calming effect, for example, on infants, also being achieved if a printed surface with a correspondingly selected motif is provided. Undesirable skin reactions caused by other material surfaces that are perceived as being troublesome thusly can be prevented. The film comprising the nap arrangement is particularly suitable for products that come in prolonged or regularly recurring contact with the skin.

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It is advantageous that the topsheet and backsheet are essentially manufactured from the same material, namely a single-layer or multi-layer film of a thermoplastic plastic which comprises a fibrous web on at least one side, wherein the fibrous web is worked, in an integrated fashion, from the material of the film situated on the surface, wherein the film used for the topsheet contains perforations within the fibrous web which allow a permeation of the film by water and aqueous solutions due to capillary forces and/or normal flow behavior, and wherein the film used for the backsheet is not provided with such perforations.

The particular advantage of the aforementioned arrangement can be seen in the fact that different films for the topsheet and the backsheet do not have to be maintained in storage for an on-line method because a practically untreated film can be used for the backsheet film, with the topsheet film being provided with corresponding perforations.

The film comprising a nap arrangement may only be used in certain regions of the hygiene product, for example, in the regions that come in contact with the skin when the hygiene product is used.

A method for manufacturing the film for the hygiene product comprises, for example, the following production steps:

- a thermoplastic plastic material is applied in the molten state or in the form of a film onto a surface of adjustable temperature that is realized in the form of a negative structure (female mold) of the desired structure, with said surface having a lower adhesion tendency than the plastic material and being provided with numerous fine cavities in the form of blind bores, and with the thermoplastic plastic material being maintained at the melting temperature at least in the region in which is in contact with the surface;
- pressure is exerted upon the plastic material such that it is pressed into the cavities while the residual volume in the cavities is compressed, namely such that the female mold is filled but the cavities are only partially filled out with thermoplastic plastic material;
- the deformed thermoplastic plastic material is - while still lying on the surface - solidified by means of cooling, wherein the plastic material

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assumes the corresponding surface structure on of the side that was brought in contact with the surface, and

- 5 - the pressure exerted upon the plastic material is alleviated such that the air compressed in the interior of the cavities partially presses the plastic material outward, and the solidified plastic material is withdrawn from the surface in the form of a structured film, wherein the thermoplastic material that was pressed into and withdrawn from the cavities forms a fibrous web consisting of projections and naps.

10

 This makes it possible to manufacture a semifinished product that is structured in a fiber-like fashion on at least one side, wherein the projections are elongated to form nap fibers.

15

 The naps that form of the fibrous web can be additionally extended by means of combing, brushing, raking and/or shearing such that the length of the projections of the fibrous web can, on average, be at least doubled in comparison to their original length.

20

 In another method for manufacturing the film, the thermoplastic plastic material is pressed into the openings of the female mold by means of a calendar system in a state in which it is heated to at least above the softening temperature and solidified in the openings to such a degree that it is at least slightly deformed in a plastic fashion when it is withdrawn from the openings in order to form the naps.

25

 According to another method, the thermoplastic plastic material is pressed into the openings of the female mold by means of a calendar system in a state in which is heated to at least above the softening temperature and solidified in the openings, namely to such a degree that it needs to be barely deformed in order to form the naps when it is withdrawn from the openings.

30

 When withdrawing the thermoplastic material, it is possible to influence the formation of the naps by varying the angle of withdrawal of the film from the female mold and the corresponding rotational speed or transport speed of the film.

35 Other influential factors are the duration during which the material remains on the roller, as well as the force with which the film is withdrawn from the female mold.

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The formation of the naps can also be influenced by correspondingly adjusting the temperature to which the film is heated. This heating may take place in the form of direct thermal conduction, for example, from the female mold to the film, or indirectly by means of radiation, e.g., microwaves or ultrasonic waves, or a
5 different type of energy supply, for example, convection.

Polyolefins or copolymers in which at least one of the polymers is a polyolefin are suitable as film materials. However, it would also be possible to utilize other thermoplastic plastics, e.g., polyamides such as polyvinyl alcohols,
10 polyester, polyether ester or polyester amides.

Film surfaces with 2000 - 12,000 individual naps proved to be particularly advantageous, wherein the naps preferably have a diameter of 20 - 80 μm and a length between 80 μm and 800 μm . When used in products that come in direct
15 contact with the skin or objects, the nap dimensions provided below proved advantageous: average diameter 40 μm - 60 μm , length 100 μm - 240 μm , nap density between 280 and 550 naps per square centimeter.

The invention is described below with reference to a few embodiments
20 that are illustrated in the figures. The figures show:

Figure 1, a partially sectioned schematic top view of an incontinence article;

25 Figure 2, a schematic top view of a topsheet film and a backsheet film which serves for comparison purposes, and

Figure 3, a schematic representation of a device for manufacturing hygiene products.

30

EXAMPLE 1

A LDPE film with a thickness of 100 μm is provided with naps on a roller that is heated to a temperature between 120 and 150 $^{\circ}\text{C}$ and contains cavities, with
35 the naps being produced in a density of 3000 naps/ cm^2 . Brush rollers are used for extending the naps on the film surface into longer naps that have an average diameter of 40 μm and a length between 80 and 500 μm . The resulting fibrous

web is situated on one side and provides the film with a fleece-like surface on this side. The method is essentially based on the method described in patent application 198 43 109. The disclosure of this citation is claimed in its entirety.

5 An outer layer that is essentially impermeable to fluids and referred to as the backsheet 20 is required for manufacturing a disposable diaper 100 (see Figure 1). The layer that comes in contact with the body is referred to as the topsheet 30. The latter is impermeable to fluids. An absorbent layer 40 is situated between the films 20 and 30. The topsheet and the backsheet 30 and 20 are connected to one
10 another at the outer edges such that the absorbent layer is enclosed between said films similar to a pad. In addition, holding parts 36 and stability parts 60 and 62 are provided.

15 The topsheet and the backsheet consist of the same aforementioned film in this embodiment; however, the topsheet film is provided with numerous fine perforations 1 immediately before the manufacture of the incontinence article, namely with the aid of a porcupine roller. These perforations have an average diameter of approximately 2 mm and are uniformly distributed in a density of 15 perforations/cm² such that the naps situated on the outer side of the topsheet
20 initially absorb the fluid and convey said fluid to the perforations, directly underneath of which the absorbent mass is arranged. Consequently, the fluid migrates into the absorbent pad due to the capillary forces.

25 The film used for the backsheet essentially consists of the same film as that used for the topsheet, but does not contain the aforementioned perforations.

30 The differences between the respective sheets are schematically illustrated in Figure 2. In this case, the film with perforations is shown on the left side, and the same film without perforations is shown on the right side.

EXAMPLE 2

35 A multi-layer film with a thickness of 60 µm is produced on a double extruder system, wherein the upper layer of the film which can be deformed more easily has a thickness of 30 µm and the carrier layer also has a thickness of 30 µm. A mixture of two copolymers with different densities is used for the upper layer. These polymers consist of two polyolefin products that are manufactured in

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accordance with the Metallocen method and available from The Dow Chemical Company under the brand name Affinity™ Polyolefin Plastomer (POP).

5 In the aforementioned copolymers, a mixture consisting of 30 parts Affinity™ HM 1250 with a melting index of 30 g/min and a density of 0.885 g/cm² and 70 parts Affinity™ HM 1100 with a melting index of 18 g/min is used. The mixing ratio may also be reversed.

10 A LLDPE with a melting index of 1 and a density of 0.916 is used for the carrier layer, wherein said material is available from The Dow Chemical Company under the brand name ELITE™ 5400 EPE (Enhanced Polyethylene).

15 Internal lubricants, pigments, stabilizers and parting agents in a content of up to 10 weight percent are also added to the film. The film is manufactured in accordance with the so-called chill-roll method. The film is subsequently transported to a system that contains a female mold roller and a rubber roller and deformed in the gap between these rollers.

20 In this case, the female mold roller consists of steel and contains, for example, 1000 - 4000 blind holes per cm². The blind holes have a diameter of 60 µm and a depth of 400 µm. The rubber roller consists of a steel core that is provided with a casing of temperature-insensitive fluorocautchouc. The female mold roller is heated to 140 °C. The rubber roller is cooled. After the polyethylene film has passed through the gap between the rollers, 3000 naps per cm² were produced by means of deformation. Fine fibers with more than twice the length of the naps are then produced by means of shearing methods. After the method is completed, a textile-like film is obtained which can be used for the backsheet and, in a perforated version, for the topsheet.

30 EXAMPLE 3

35 A polypropylene film with a thickness of 60 µm and a melting range of approximately 180 °C is laminated together with a polypropylene-polyethylene copolymer film with a thickness of 80 µm which has a higher rigidity than the first-mentioned film. The harder film is conventionally manufactured by means of a slot nozzle extruder and unwound from a supply roll, with the softer film being directly applied onto a roller in a fusible state from an extruder via a wide-slot

nozzle. The roller is provided with cavities that produce naps in a density of 5000 naps/cm² on the softer film. The more rigid film is simultaneously fed to the roller and laminated into a two-layer film together with the softer film.

5 Naps with a length of 80 - 100 µm and a diameter between 10 and 60 µm are then produced by means of brush rollers and doctor blades as they are described in German patent application 198 43 109.

10 A thin, superabsorbent female sanitary napkin is manufactured from this film, with said female sanitary napkin containing a thin superabsorber layer of cellular material that is held between the two films similar to a pad. The topsheet, i.e., the film that comes in contact with the body, is provided with fine perforations that have a diameter of 7 µm and are produced in a density of 100 perforations/cm², namely with the aid of a laser. The backsheets is not provided
15 with such perforations.

EXAMPLE 4

20 The film with a velour-like surface is subjected to a special embossing-type perforating process. In this case, a tool is used which consists of a porcupine roller with approximately 15.4 spikes/cm² and a mating roller that is realized in the form of a female mold roller, with the spikes of the porcupine roller having a diameter of 2 mm and free-standing tips of 5.5 mm length. A steel roller that can be cooled and heated is used as the female mold roller. The steel roller contains a
25 casing of fluorocaoutchouc. The surface consisting of fluorocaoutchouc has a thickness of approximately 5 mm. Bores are produced in the fluorocaoutchouc layer by means of a powerful laser. The spikes of the porcupine roller engage into these bores. The female mold roller also contains 15.4 bores/cm². When the tool is closed, the spikes run in the female mold part in accordance with an involute.

30 The female mold bores have an opening of 1.9 mm and a depth of 2 mm. The perforations are produced by means of female mold/male mold embossing or perforating. The spikes push the film into the opposing openings, stretch the film until it fractures and ultimately open the film. In this case, a permanent
35 deformation or stretching of the film takes place at a porcupine roller temperature of 60 °C.

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The fine fiber structure on the surface of the perforated film is preserved in this case, with the fiber structure simultaneously assuming the three-dimensional shape attained by means of stretching with the aforementioned spikes.

5 The desired velour-like film with depressions in the shape of truncated cones that are open on their end is achieved in this fashion. This results in a well suited cover sheet or topsheet material that can also be used in other products.

10 The surface of the film has a soft feel similar to a textile, and the fluid is pressed into the cone-like depressions and transported to the absorbent layers situated underneath through the openings.

15 The return of the fluid to the surface which is also referred to as "rewetting" is prevented by the fine valve-like openings at the cone tips of the film. The deformation or perforation of the velour film takes place at approximately 60 °C because this temperature neither causes undesirable changes of the film nor a destruction of the fine velour fibers.

20 The perforations may have a smaller or larger size and be functionally or aesthetically arranged in accordance with the respective requirements.

25 Another type of perforations is produced by stretching the film material. In this case, the film material contains, for example, polypropylene with chalk and/or a beta nucleation agent. The nucleation agent is preferably added in a concentration between 0.1 ppm and 100 ppm and extracted before the stretching of the film. In addition to chalk, other fillers may be added to the thermoplastic film material. In addition to fillers, it is also possible to add mixable additives that precipitate during crystallization. Openings are formed in the film material due to the thusly occurring phase break. This means that an extractable substance can be
30 arranged in the film such that openings are created in film regions between adjacent naps when extracting the substance from the film. Tests have demonstrated that, in particular, the mixing of the thermoplastic material to be extruded with the substance does not impair the formation of the naps by pressing the film material into the female mold openings. In order to extract the substance,
35 the film is, for example, stretched such that predetermined openings can be formed between the roots of the naps of the naps arrangement.

A thin, superabsorbent female sanitary napkin, in which a thin superabsorbent layer of cellular material is held between two films similar to a pad, is manufactured from the two films, i.e., from the backsheet film provided with the velour surface and the topsheet film that additionally contains perforations. In this case, the topsheet, i.e., the film that comes in contact with the body, is provided with fine perforations that have a diameter of 2 mm and are arranged in a density of 14 - 16 perforations/cm². A velour film without the aforementioned perforations can be used for the backsheet.

The naps have the shape of a truncated cone, namely at least at their tips. The truncated cones are regularly arranged in rows and, according to one advantageous embodiment, spaced apart from one another by approximately 120 μ m referred to their respective center. The truncated cones have a diameter that amounts to approximately half their height of 140 μ m, e.g., on the order of 60 μ m. The naps have a diameter between approximately 80 and 100 μ m at their base, i.e., at the root of the truncated cone which transforms into a region of the film that remains plane. At the tip of the truncated cone, the diameter lies between approximately 30 μ m and 45 μ m. The truncated cones are approximately straight, but may also be slightly tilted toward one side. The truncated cone itself is slightly curved, with the curvature pointing toward the interior of the truncated cone. An edge of the truncated cone which is open on the top contains furrows and consequently has a irregular structure. The truncated cones are also partially hollow in their interior, with the edges of the truncated cone which are open on the top having a zigzag-like shape similar to a crown.

Figure 3 shows one possibility for processing a film 200 by means of a device 205 for manufacturing hygiene products in the form of a schematic representation. In this case, not all processing stations are shown, for example, the station in which the upper side and the lower side of the hygiene product are connected to one another. Thermoplastic material 210 is supplied to a calendar 220 in the form of a prefabricated film 200 by means of a supply device 215. The calendar 220 contains a first roller 230 and a second roller 240. The first roller 240 contains openings 245 that are followed by cavities 250. A surface 260 of the first roller 240 preferably contains a coating with an extremely low adhesion tendency referred to the thermoplastic material 210 used. The film 200 is partially pressed into the cavities 250 while it passes through the calendar gap 270 in order to form the nap arrangement. The cavities 250 are preferably realized cylindrically at least

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in the predominant portion. The film 200 is correspondingly heated in the device 205 by guiding the film 200 over the first roller 230 along a looping angle between 25 and 90° until it reaches the calendar gap 270. However, the film is only heated to a maximum temperature that lies slightly below the melting temperature, preferably up to or slightly below the softening temperature, by means of the first roller 230. After passing through the calendar gap, the film 200 remains looped around the first roller 230 by an angle between 15° and 130°, preferably below 90°. The film 200 can be cooled over this looping angle or, if so desired, heated anew, for example, in order to be subsequently cooled.

10

A third roller 280 that serves as the withdrawal device 290 is arranged adjacent to the first roller 230. The withdrawal device 290 is preferably arranged such that it can be moved around the circumference of the first roller 230. Depending on the thermoplastic material used and the processing speed, this makes it possible to adjust the desired looping angle. The withdrawal device 290 makes it possible to withdraw the film 200 from the first roller 230 at an angle between 5° and 75°. The withdrawal device 290 may, however, also be designed such that angles of withdrawal in excess of 75° can be realized. The angle of withdrawal can also be influenced by choosing the diameter of the third roller 280 accordingly, as well as with other constructive measures.

20

According to one additional development, the withdrawal device 290 contains a fourth roller 300 that is illustrated with broken lines. The third roller 280 and the fourth roller 300 are arranged such that they can be moved relative to one another. This makes it possible to also vary the angle of withdrawal during the operation of the device. The angle of withdrawal that is indicated by a double arrow is defined as described below: it includes the angle between a first tangent on the first roller 230 and a second tangent on the third roller 280. The first tangent extends through the point at which the film contacts the first roller 230 last. The second tangent extends through the point on the third roller 280 at which the film 200 contacts the third roller 280 last. The figure shows two angles of withdrawal in order to indicate that the angle of withdrawal can be varied.

25

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At least one additional processing station 310 is arranged downstream of the withdrawal device 290. In this case, the additional processing station 310 consists of a device for coloring the film, for example, by means of printing. However, the additional processing station 310 may also consist of a stretching

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station. In this case, the film 200 is correspondingly treated in order to realize perforations or corresponding material properties as they can be achieved by means of overstretching. Another additional processing station in the form of a female mold/male mold perforating system 320 is arranged upstream of the coloring device. The system 320 contains a porcupine roller 325 and a female mold roller 330 and serves for perforating the film 200.

CLAIMS

1. A hygiene product, with an upper side (30) that is permeable to fluids and intended for being in permanent contact with the skin, and with a lower side (20) that preferably is impermeable to fluids, wherein an absorbent layer is arranged between the upper side (30) and the lower side (20),

characterized by the fact that

- the upper side (30) comprises a perforated film (200) that is composed of several layers, wherein the top layer of said film is entirely or partially covered with a fibrous web, and wherein the film is provided with a nap arrangement that is worked from the top film layer.

2. The hygiene product according to Claim 1, characterized by the fact that the lower side (20) comprises a multi-layer film that is permeable to vapors and impermeable to fluids, wherein the multi-layer film is covered with a fibrous web.

3. The hygiene product according to Claim 1 or 2, characterized by the fact that the lower side (20) comprises a non-perforated film that is composed of several layers, wherein the top layer of said film is entirely or partially covered with a fibrous web.

4. The hygiene product according to one of Claims 1 - 3, characterized by the fact that the hygiene product has a first side and a second side which respectively comprise the film (200) with a nap arrangement.

5. The hygiene product according to one of Claims 1 - 4, characterized by the fact that the nap arrangement of the first side has a different length than the nap arrangement of the second side.

6. The hygiene product according to one of Claims 1 - 5, characterized by the fact that the upper side (30) and/or the lower side (20) comprise at least one strip with the film that is provided with a fibrous web.

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7. The hygiene product according to one of Claims 1 - 6, characterized by the fact that the naps (2) which form the fibrous web of the lower side (20) have a length between 100 micrometer and 400 micrometer, and by the fact that the naps (2) which form the fibrous web of the upper side (30) have a length between 50 micrometer and 150 micrometer.

8. The hygiene product according to one of the preceding claims, characterized by the fact that an additional substance is applied onto the fibrous web.

9. The hygiene product according to one of the preceding claims, characterized by the fact that at least one skin care substance is applied onto the fibrous web of the upper side (30).

10. The hygiene product according to one of the preceding claims, characterized by the fact that the tip of a nap (2) approximately has a crater-like shape that is the least partially hollow in its interior.

11. The hygiene product according to one of the preceding claims, characterized by the fact that the fibrous web of the lower side (20) makes it possible to fix the hygiene product on a contact surface.

12. The hygiene product according to one of the preceding claims, characterized by the fact that the top layer of the upper side (30) is only partially covered with the fibrous web, and by the fact that a connecting means, in particular, an adhesive, is applied onto the surface section of the upper side (30) which is not provided with a fibrous web.

13. The hygiene product according to one of the preceding claims, characterized by the fact that the hygiene product consists of an incontinence article.

14. The hygiene product according to one of the preceding claims, characterized by the fact that the hygiene product consists of a bed insert.

15. The hygiene product according to one of Claims 1 - 14, characterized by the fact that the hygiene product consists of a bandaging material, in particular, a wound bandaging or wound covering material.
- 5 16. The hygiene product according to Claim 15, characterized by the fact that the naps (2) of the fibrous web of the wound bandaging or wound covering material have a different length in the wound contact region than outside of the wound contact region.
- 10 17. The hygiene product according to Claim 16, characterized by the fact that the fibrous web has a length between 50 and 150 micrometer in the wound contact region and a length between 0 and 80 micrometer outside of this wound contact region.
- 15 18. The hygiene product according to one of the preceding claims, characterized by the fact that the upper side (30) and the lower side (20) are essentially manufactured from the same material, namely from a single-layer or multi-layer film that consists of a thermoplastic plastic and is provided with a fibrous web on at least one side, wherein the fibrous web is, in an integrated
20 fashion, worked from the film material situated on the surface, wherein the film used for the upper side (20) is provided with perforations (1) that lie underneath the fibrous web, and wherein the film used for the lower side (30) does not contain such perforations (1).
- 25 19. The hygiene product according to one of the preceding claims, characterized by the fact that the naps (2) have a diameter of approximately 5 μm - 80 μm , in particular, an average diameter between 40 μm and 70 μm .

- 22 -

20. The hygiene product according to one of the preceding claims, characterized by the fact that the naps (2) have a length between 80 and 800 μm , wherein the length of the naps preferably lies between 110 μm and 400 μm , in particular, between 130 mm and 190 μm .

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21. The hygiene product according to one of the preceding claims, characterized by the fact that the film (200) is printed.

22. A method for manufacturing a hygiene product, wherein a film (200) is
10 used which contains a thermoplastic polymer and is additionally processed into a hygiene product,

characterized by the fact that

15 a fibrous web consisting of a nap arrangement is produced on a least one side of the film, wherein the naps (2) are worked, in an integrated fashion, from at least the film material situated on the surface merely by pressing said film material into cavities (250) of a female mold, subjecting the film material to pressure and cooling the film material solely by means of a calendar (220),
20 wherein the film material that remains adhering to the interior of the cavities (250) is subsequently withdrawn, and wherein the upper side (30) is intended for being in permanent contact with the skin.

23. The method according to Claim 22, characterized by the fact that the film
25 (200) is withdrawn in such a way that the naps (2) are stretched by no more than a third of their length, in particular, such that a stretching of no more than 10 % takes place.

24. The method according to Claim 22 or 23, characterized by the fact that a
30 withdrawn nap (2) assumes an approximately crater-like shape at its tip.

25. The method according to Claim 22, 23 or 24 for perforating the film (200) that is provided with a nap arrangement, characterized by the fact that a female mold/male mold perforation by means of a porcupine roller (325) and a female
35 mold roller (330) provided with holes is carried out at a temperature that lies below the temperature at which the naps (2) are destroyed.

26. The method according to one of Claims 22 - 25, characterized by the fact that an extractable substance is arranged in the film (200) in such a way that, when the substance is extracted from the film (200), openings are created in the film regions between adjacent naps (2).

5

27. The method according to one of Claims 22 - 26, characterized by the fact that the film (200) is additionally processed into an upper side (30) and a lower side (20) of the hygiene product.

10 28. The method according to one of Claims 22 - 27, characterized by the fact that a hygiene product is manufactured which comprises an upper side (30) that is permeable to fluids and a lower side (20) that is permeable to fluids, wherein an absorbent layer is arranged between the upper side and the lower side, wherein a multi-layer perforated film (200), the top layer of which is entirely of partially
15 covered with a fibrous web, is used for the upper side (30), and wherein the upper side (30) is intended for being in permanent contact with the skin.

29. The method according to one of Claims 22 - 28, characterized by the fact that the film (200) with its nap arrangement is arranged in such a way that the
20 naps (2) point into the interior of the hygiene product.

30. The hygiene product manufactured in accordance with one of Claims 22 -

31. A device for manufacturing a hygiene product, comprising a device (205)
25 for producing a napped film, i.e., a film (200) that is provided with a fibrous web consisting of a nap arrangement on a least one side, with a calendar (220), and with a device (215) for supplying the film (200), wherein

30 - one roller (230) of the calendar (220) contains cavities (250), wherein

- the pressure in the calendar gap (270) and the rotational speed of one calendar roller can be adjusted such that a thermoplastic material guided through the calendar gap (270) is pressed into
35 cavities (250), and wherein

- 24 -

- the film (200) is guided into the calendar gap (270) by the supply device (215) in order to press the film into the cavities (250),

characterized by the fact that

5

the cavities (250) have a diameter of up to 0.15 millimeter, and by the fact that the roller (230) is heated to a maximum temperature that lies slightly below the melting temperature of the film (200).

- 10 32. The device (205) according to Claim 31, characterized by the fact that a withdrawal device makes it possible to vary the angle of withdrawal.

- 15 33. The device (205) according to Claim 31 or 32, characterized by the fact that an additional processing station (310), in particular, a printing station, is arranged downstream of the device.

- 20 34. The device (205) according to one of Claims 31, 32 or 33, characterized by the fact that an in-line perforating station is arranged downstream or upstream of the device.

- 25 -

ABSTRACT

5 The invention relates to a method and device for producing a film comprising fibrous web which is located on at least one side and which consists of a nap arrangement in order to produce a hygiene product. The naps were worked in an integrated manner, at least from the film material located on the surface merely by pressing and generating pressure in openings of a matrix, alone or by using a calendar and by the subsequent withdrawal thereof.

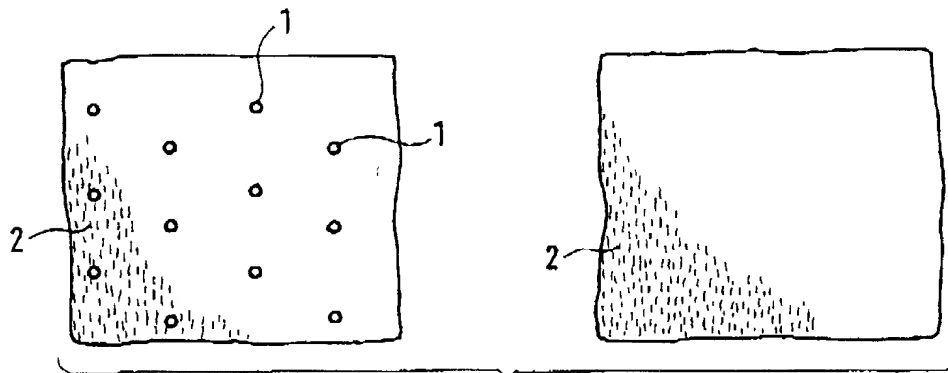
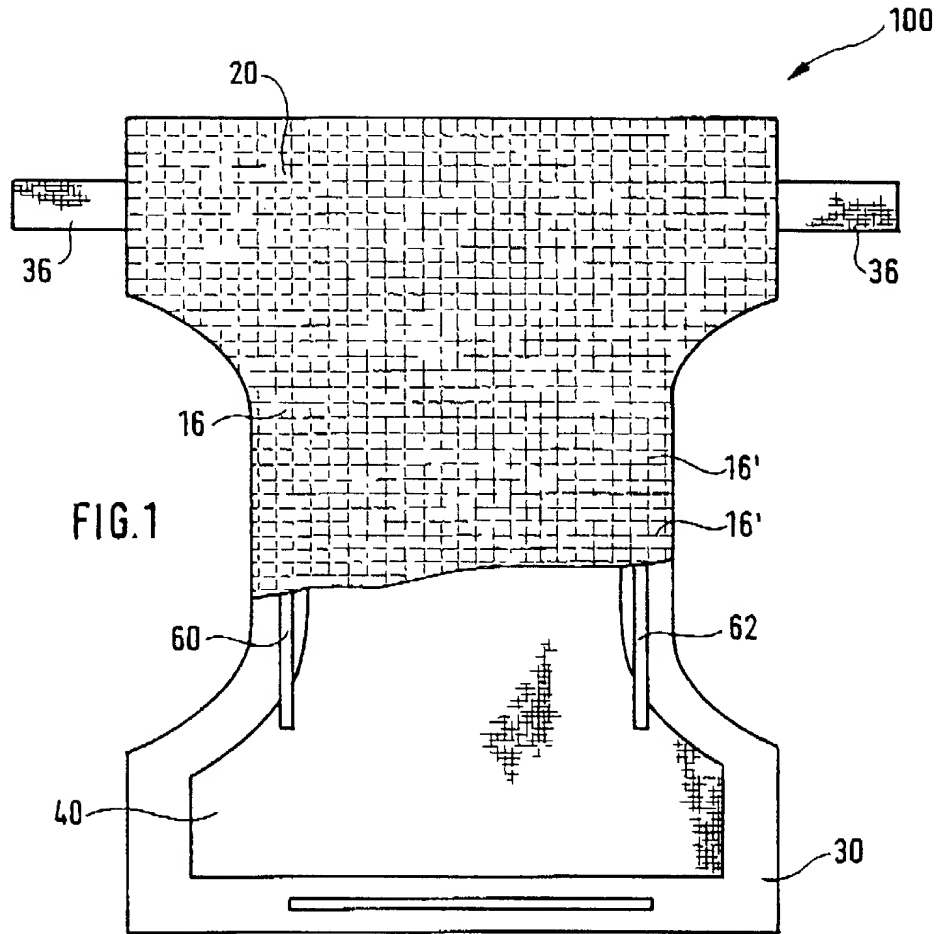
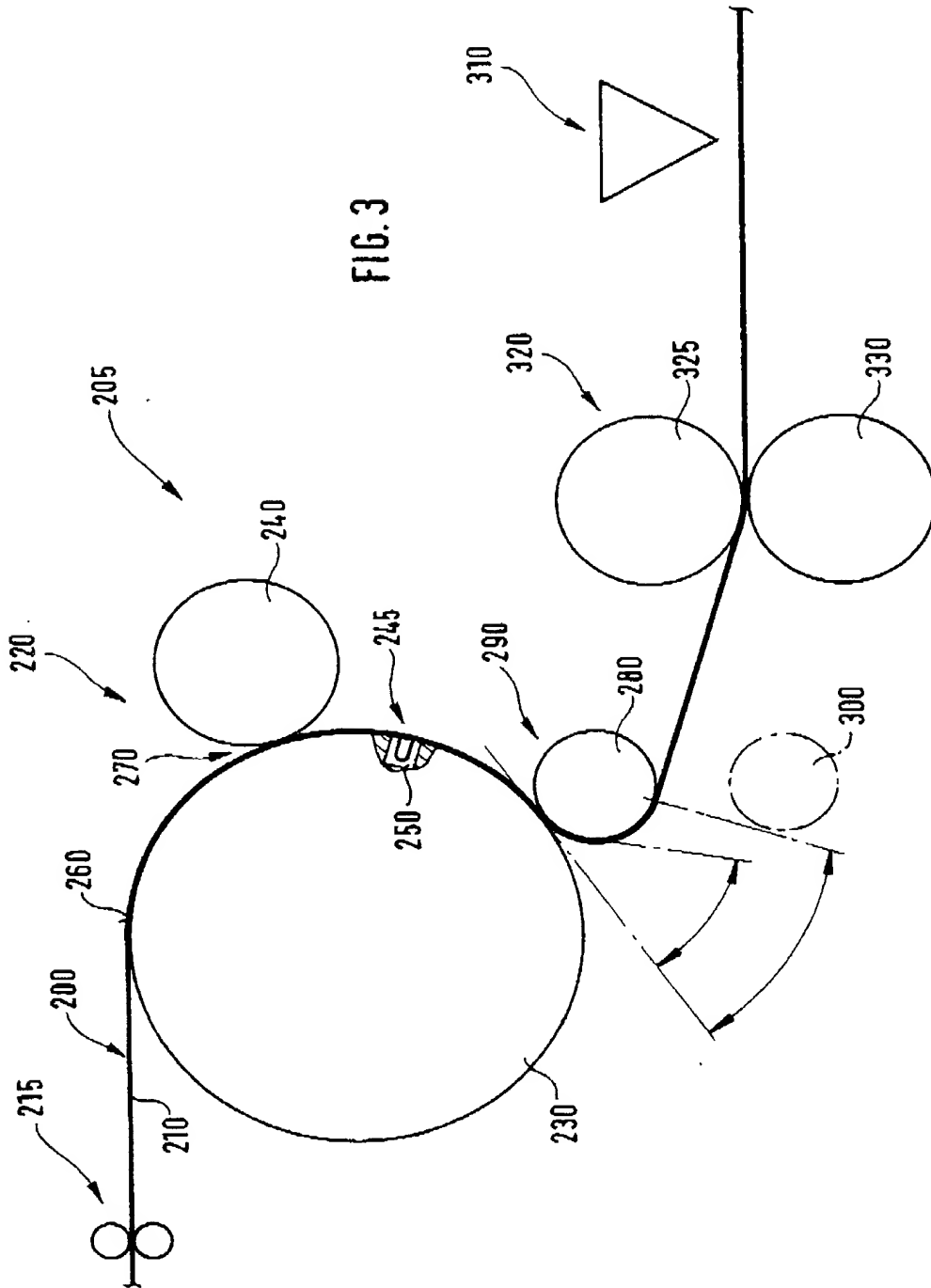


FIG. 2

FIG. 3



**DECLARATION
FOR PATENT APPLICATION**

As an undersigned inventor, I hereby declare that:

My residence, post office address and country of citizenship are as stated directly below my name.

I believe (check one) ☐ I am the original, first and sole inventor
☒ I am a joint inventor and the below named inventors are the original and first inventors

of the subject matter which is claimed and for which a patent is sought on the invention entitled

HYGIENE PRODUCTS COMPRISING A FILM WITH A NAP ARRANGEMENT

the specification of which

(check one) ☐ is attached hereto.
☒ was filed on October 26, 2001,
as Application Serial No. 09/980,807,
and was amended on October 26, 2001.
(if applicable)

I further declare that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office (hereinafter "the Office") all information known to me to be material to patentability of the subject matter which is claimed as defined in 37 C.F.R. §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119 of any foreign application(s) for patent or inventor's certificate indicated below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority
Number	Country	Day/Month/Year Filed	Claimed
			Yes No
DE 199 19 397.5	Germany	28 April 1999	X

I hereby claim the benefit under 35 U.S. C. §119(e) of any United States provisional application listed below:

Provisional Application Serial No.**Filing Date**

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) and PCT international application designating the United States listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in 37 C.F.R. § 1.56, which became available between the filing date of the prior application and the national or PCT international filing date of this application:

<u>Application Serial No.</u>	<u>Filing Date</u>	<u>Status (patented, pending, abandoned)</u>
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PCT/EP00/03868	April 28, 2000	
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Address all correspondence and telephone calls to the following:

Robert M. O'Keefe
O'KEEFE, EGAN & PETERMAN
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, TX 78746
(512) 347-1611
(512) 347-1615 (Fax)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and may jeopardize the validity of the application or any patent issued thereon.

Inventor's Signature L. James Wagner 12.05.2002
Date

Residence: c/o Dels Estranys 69, Urb. Bon Air, ES-07409 Mallorca-
Citizenship: Germany Alcudia
Spain ESX

Post Office Address: same
(enter "same" if mailing address is same as residence address)

Full name of second joint inventor: Thomas Allgeuer

Inventor's Signature _____ Date _____

Residence: _____

Citizenship: _____

Post Office Address: _____
(enter "same" if mailing address is same as residence address)

Full name of third joint inventor: _____

Inventor's Signature _____ Date _____

Residence: _____

Citizenship: _____

Post Office Address: _____
(enter "same" if mailing address is same as residence address)



DECLARATION FOR PATENT APPLICATION

As an undersigned inventor, I hereby declare that:

My residence, post office address and country of citizenship are as stated directly below my name.

I believe (check one) ☐ I am the original, first and sole inventor
☒ I am a joint inventor and the below named inventors are the original
 and first inventors

of the subject matter which is claimed and for which a patent is sought on the invention entitled

HYGIENE PRODUCTS COMPRISING A FILM WITH A NAP ARRANGEMENT

the specification of which

(check one) ☐ is attached hereto.
☒ was filed on October 26, 2001,
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Provisional Application Serial No.

Filing Date

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Address all correspondence and telephone calls to the following:

Robert M. O'Keefe
O'KEEFE, EGAN & PETERMAN
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, TX 78746
(512) 347-1611
(512) 347-1615 (Fax)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and may jeopardize the validity of the application or any patent issued thereon.

Full name of first joint inventor: Werner Wagner

Inventor's Signature _____ Date _____

Residence: _____

Citizenship: _____

Post Office Address: _____
(enter "same" if mailing address is same as residence address)

2 - cc Full name of second joint inventor: Thomas Allgeuer

Inventor's Signature  _____ Date 5/4/02

Residence: Felsenrainstrasse 7A 8832 Wollerau ATX

Citizenship: Austria

Post Office Address: Felsenrainstrasse 7A 8832 Wollerau
(enter "same" if mailing address is same as residence address)

Full name of third joint inventor: _____

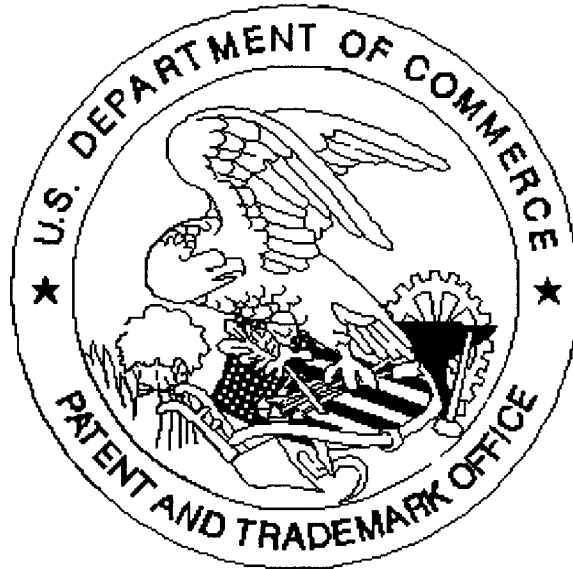
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